

Alternatives Analysis

for

STPP 69-1(9)22

Boulder-South

(CN 2019)

in

Jefferson County, Montana



September 2006

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1.0 HISTORY AND BACKGROUND

A portion of Montana State Primary Route 69 (MT 69) south of Boulder, in Jefferson County, was nominated for reconstruction, and a preliminary field review was conducted by the Montana Department of Transportation (MDT) in May 2004. MDT announced plans to reconstruct a portion of MT 69 in a press release in November 2004. The proposed action originally had two parts:

- Widen and improve the southern portion of the project corridor on MT 69 from Mile Post (MP) 22.186 to MP 30.8±.
- Redesign and reconstruct the portion of MT 69 from MP 30.8± to MP 37.1±.

Since that time, the project has been split. The southern portion from MP 22.186 to MP 30.8± will proceed as an independent overlay and widening project. The northern portion is the focus of this study.

Project Area Description

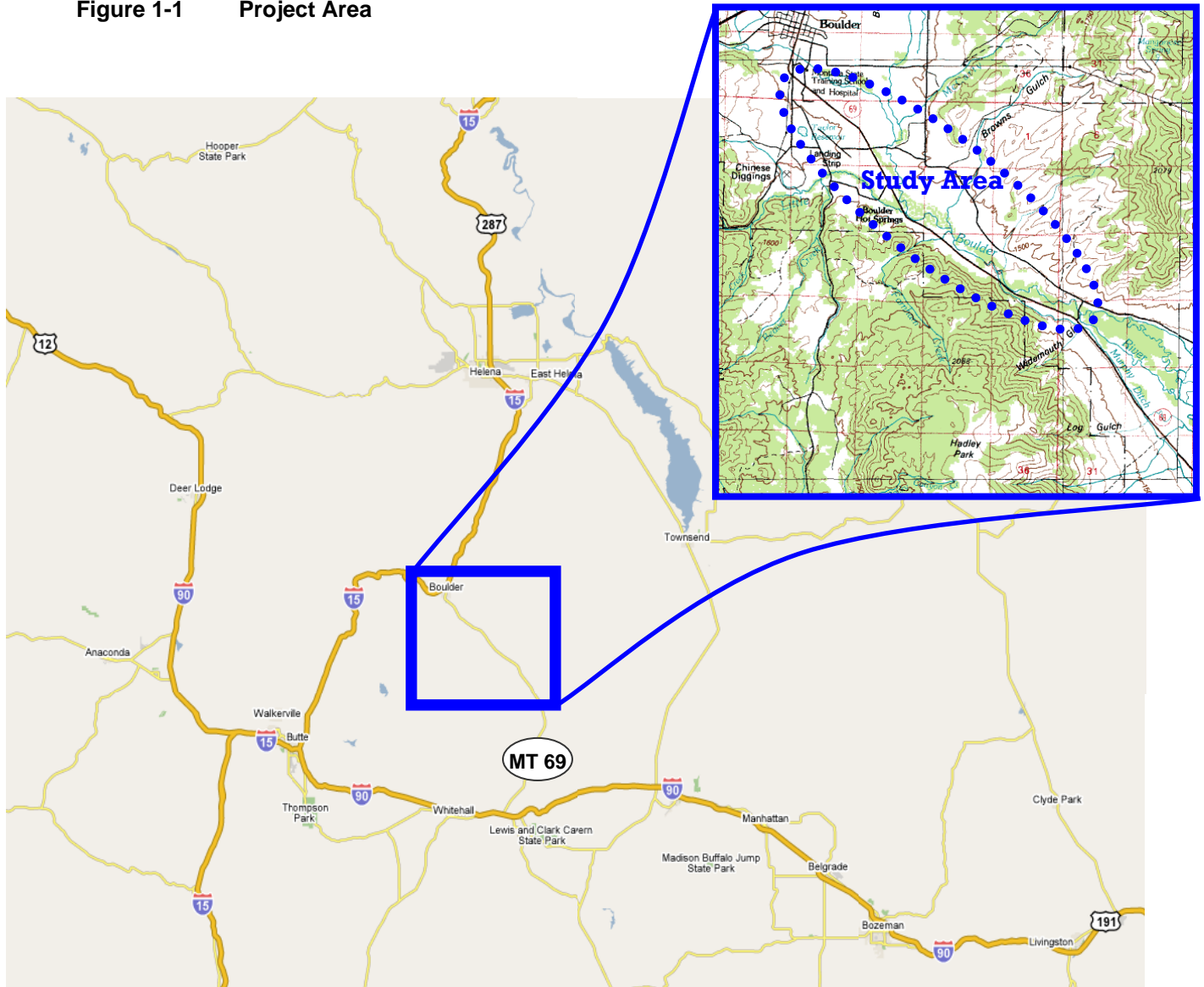
As shown in Figure 1-1, the proposed project is located within the following legal description(s):

<u>Township</u>	<u>Range</u>	<u>Section(s)</u>
5 N	3 W	18, 19
5 N	4 W	2, 3, 4, 10, 11, 13, 14, 24
6 N	4 W	32, 33

For the purposes of this Alternatives Analysis, the project area begins at MP 30.8± and extends to the north approximately six miles, ending at MP 37.1± just south of Boulder.

The existing MT 69 alignment is a state primary highway. It is used by rural residents traveling between home and work, as well as regional users traveling between Helena, Butte, Three Forks, and Bozeman. MT 69 is also an interstate truck route, and currently serves a substantial number of regional, national, and international freight carriers.

This portion of the Boulder Valley is also served by a county road that is used primarily by rural residents in Jefferson County. Residents along the county road report enjoying the rural character of the area and emphasize that they value the privacy and quiet associated with low traffic volumes along the road. The county road is also used extensively by agricultural vehicles and for moving livestock.

Figure 1-1 Project Area

MDT began the process of identifying a consultant to conduct an analysis of the proposed project and its potential impacts in December 2004. During contract negotiations with the consultant, MDT conducted a public scoping meeting held on June 1, 2005 in Boulder. The southern ($30.8\pm$ to MP $37.1\pm$) and northern (MP 22.186 to MP $30.8\pm$) portions of the proposed project, and two alignment alternatives for the northern portion were presented at the public meeting. One alignment option involved reconstruction of the existing MT 69 alignment, and one involved construction of a new alignment on the east side of the Boulder River following the existing county road as much as practicable. Approximately 100 people attended the meeting and the majority of those in attendance expressed their disapproval of any new alignment east of the river.

Many residents who own property on the east side noted that they would not be willing sellers of any needed right-of-way for a new alignment. State Representative Scott Mendenhall expressed

his concern that the state would have a difficult time justifying the acquisition of property on the east side of the river if it would be at all feasible to reconstruct the existing MT 69 alignment. Through later correspondence, the Jefferson County Commission and Planning Board separately expressed their concern over a new alignment and favored reconstruction along the existing MT 69 alignment.

Given the intense level of public opposition and the admonitions from state and local elected officials, MDT determined that it would be most beneficial to conduct a pre-NEPA screening of alternatives to compare the relative pros and cons of the two alternatives under consideration. This screening was intended to be brief and only detailed enough to determine whether additional analyses were warranted, or if an alternative could clearly be eliminated due to a magnitude of projected difference in impacts or construction costs.

The following Alternatives Analysis documents the history of the project; the rationale for the development of alternatives; physical opportunities and constraints in the corridor; screening criteria; qualitative, planning-level analysis of impacts; planning-level cost estimates; and public and agency concerns expressed to date.

This analysis is intended only as a guide. It does not provide a recommendation for a proposed project, nor does it supplant the need for further NEPA/MEPA analysis for an actual project proposal.

2.0 DEVELOPMENT OF ALTERNATIVES

The existing MT 69 alignment in this corridor is a narrow, two-lane facility with limited shoulders and steep side slopes. The alignment generally follows the Boulder River through this corridor with wetlands on either side of the road and a substantial rock outcropping adjacent to the western side of the road near MP 34±. A representative portion of the road is shown in Figure 2-1.

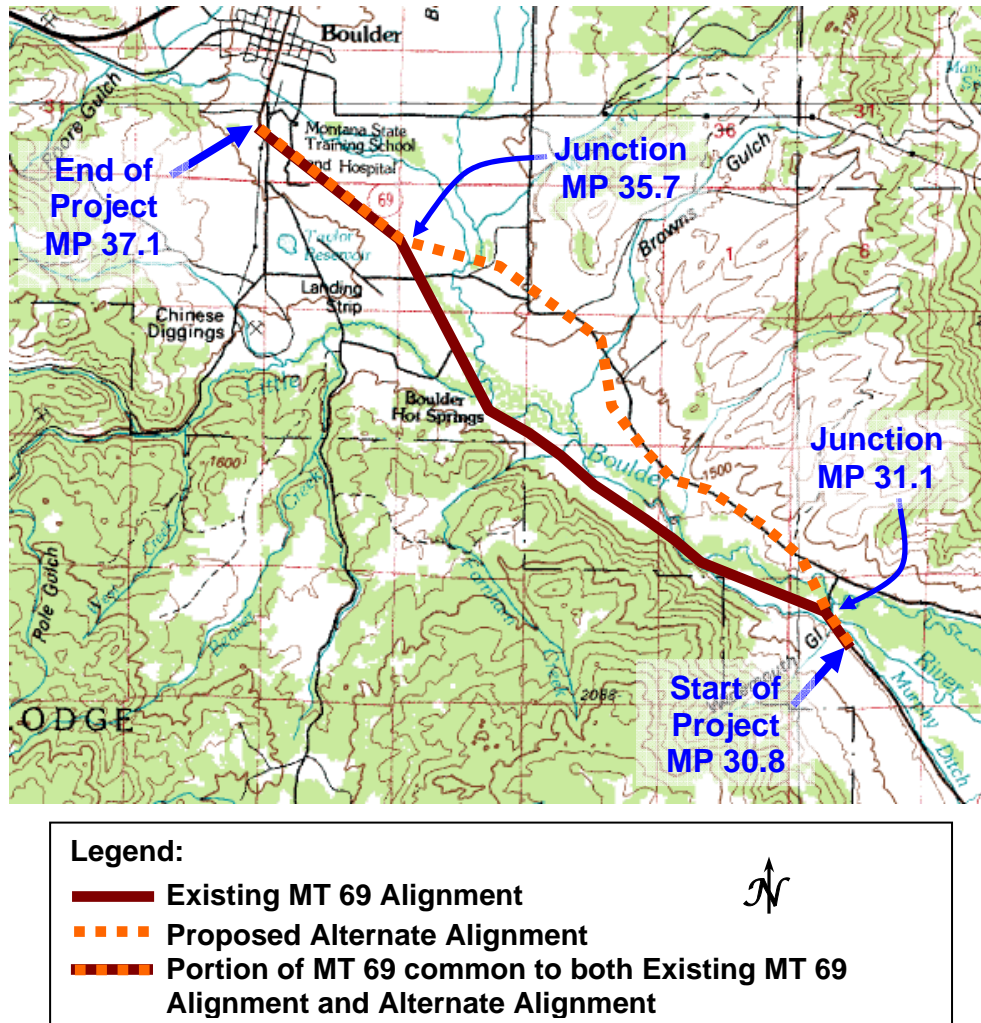
Figure 2-1
Existing Roadway Along Boulder River



MT 69 was nominated for reconstruction based on geometric deficiencies and safety concerns. Existing roadway geometrics along this portion of the route do not meet current standards and do not provide the desirable levels of safety and efficiency. The Preliminary Field Report prepared for the entire corridor noted horizontal and vertical geometric deficiencies. The overall accident severity rate for the portion of MT 69 between MP 22.186 to MP 37.1 is approximately 30 percent greater than the statewide average for state rural primary highway systems. The truck severity rate for the portion of MT 69 between MP 22.186 to MP 37.1 is approximately 70 percent greater than the statewide average for state rural primary highway systems. The accident trend for all vehicles over the past ten years has continued to be single vehicle off-road crashes resulting in overturn.

When MT 69 was nominated for reconstruction, MDT took into consideration the challenges associated with providing the necessary improvements along an alignment constricted by the Boulder River and the steep side slopes; marshy land and numerous wetlands which make construction more complex, costly, and difficult to permit; and rock outcrops which cause shading and icing problems in inclement winter weather. MDT initiated the development of a conceptual alignment that would generally follow the existing county road east of the river. It was presumed that this alignment would be easier to construct, result in fewer wetland and river impacts, and provide a better opportunity to improve safety along this route.

Figure 2-2
Proposed Alignments



Existing MT 69 Alignment

This alternative would widen the existing MT 69 alignment from MP 30.8 to MP 37.1, correct several horizontal and vertical curve deficiencies, while attempting to minimize impacts to the river, wetlands, and irrigation facilities. This alternative is 6.3 miles in length. There are 85 acres of existing right-of-way along this alignment.

Alternate Alignment

As shown in Figure 2-2, this alignment would follow the existing MT 69 alignment from MP 30.8 to MP 31.1. It would cross the river at MP 31.1 and climb up out of the river bottom, generally following an existing Jefferson county road alignment. It would rejoin the existing MT 69 alignment at MP 35.7, and follow the existing MT 69 alignment from MP 35.7 to the project termini at MP 37.1. The alternate alignment is 6.41 miles long. There are 19.5 acres of existing right-of-way along this alignment on the contiguous portion of the existing alignment. The alignment between MP 31.1 and MP 35.7 is on an existing county road easement.

3.0 OPPORTUNITIES AND CONSTRAINTS

For full compliance with NEPA/MEPA regulations and permitting requirements, all federally funded actions require some level of analysis to determine whether measures can be undertaken to avoid, minimize, or mitigate anticipated impacts to sensitive resources in a given project area. Oftentimes, this analysis is conducted through the development of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). Given the high level of public sensitivity, and expressed opposition to the alternate alignment by adjacent landowners and local public officials, a full on-the-ground resource inventory of the existing MT 69 and proposed alternate alignment routes was deemed inappropriate. To conduct a broad-brush analysis in the most effective and non-intrusive manner, the analysis in this report is based on available database searches. These searches included a review of the Natural Resource Information System (NRIS) database, Natural Resource Conservation Service (NRCS) soil mapping, the Montana Natural Heritage Program (MNHP) database search and communication with MNHP biologists, U.S. Census Bureau database, and windshield surveys of the existing MT 69 and alternate alignment routes.

The analysis contained in this report is not intended to meet NEPA/MEPA requirements or provide a detailed accounting of all resources or potential impacts, but is merely intended to point out those resources or areas of social, economic, and environmental concern that would likely be a factor in future project decisions and permitting processes.

The Federal Highway Administration has provided guidance that outlines several areas of concern under NEPA. Each of the areas of concern are briefly discussed below relative to their pertinence in this corridor. All issue areas would require further study under a full environmental analysis for any specific proposed future projects.

Land Use

Land in the project area along the existing MT 69 alignment is primarily undeveloped, uncultivated wetland. Land along the alternate alignment is primarily in rangeland use, crossing wetlands near the junction points at MP 31.1 and MP 35.7.

The project area is largely under private ownership, although there are interspersed land areas owned by the state of Montana, the U.S. Forest Service, and the Bureau of Land Management.

Farmlands

The corridor contains small areas of land classified as Prime Farmland if Irrigated and Farmland of Statewide Importance. A study of impacts to these land areas would be required under any NEPA/MEPA analysis.

Social Conditions

The project corridor is largely defined by rural ranching communities. There are a number of farms and ranches located along the alternate alignment. The county road is used extensively by agricultural vehicles and for moving livestock.

Economic Conditions

MT 69 is an interstate truck route, and currently serves a substantial number of regional, national, and international freight carriers. Regional and interstate commerce is dependent on this route for the transport of goods and services. The M.S. Molitor Trucking company is a major employer in the area and currently dispatches over 50 trucks and over 60 trailers from their Boulder office.

Pedestrian and Bicycle Facilities

Pedestrian/bicycle traffic in the vicinity of the proposed project is currently limited, and the narrow paved width and lack of shoulders through much of the corridor does not encourage pedestrian/bicycle use on the existing MT 69 alignment. Although there are no formal bicycle/pedestrian facilities along the alternate alignment, low traffic volumes allow rural residents to walk and bicycle on the county road.

Air Quality

There are no air quality issues in the project corridor.

Noise

Due to the largely rural nature of the corridor, there are very few noise receptors in close proximity to either proposed alignment. A full analysis would need to be conducted to address local concerns and compliance with MDT and FWHM noise policies.

Water Quality

The Boulder River is TMDL impaired due to mining waste and agricultural run-off. Impacts to water quality resulting from implementation of either alignment would require further review under any NEPA/MEPA analysis. All roadway design and construction activities would need to be compliant with current stormwater pollution prevention control standards.

Wetlands

As shown in Figures 3-1 to 3-5, twenty-four (24) wetlands were delineated along the existing MT 69 alignment during site visits on July 6, 7, 12, and 13, 2005. Twenty-three of these are Category III wetlands, and one is a Category II wetland. Nineteen of the wetlands are considered jurisdictional under the U.S. Army Corps of Engineers (COE) 404(b) permitting guidelines because they border on or are directly connected to a Water of the U.S. An additional two wetlands may be jurisdictional because of a strong subsurface connection with the Boulder River. These two wetlands (18 and 19) are extensive and are wet meadow communities with forested or scrub-shrub edges. Consultation with the COE may be necessary to determine the need for mitigating impacts to these wetlands.

The total delineated acreage along the existing MT 69 alignment is approximately 115 acres. The jurisdictional wetlands comprise 104 acres and the non-jurisdictional wetlands, including Wetlands 18 and 19, make up the additional 11 acres. Wetlands 18 and 19 cover approximately six acres; therefore, if they are determined to be jurisdictional, their acreage would bring the total to 110 acres of jurisdictional wetlands.

Based on a review of Jefferson County soil mapping, aerial photographs, and windshield survey data, it was determined that a number of wetland areas are also located near points where the alternate alignment leaves and rejoins the existing MT 69 alignment. The total acreage of wetlands along the alternate alignment has not been surveyed, but is estimated to be less than or equal to 30 acres.

Figure 3-1
Wetland Maps

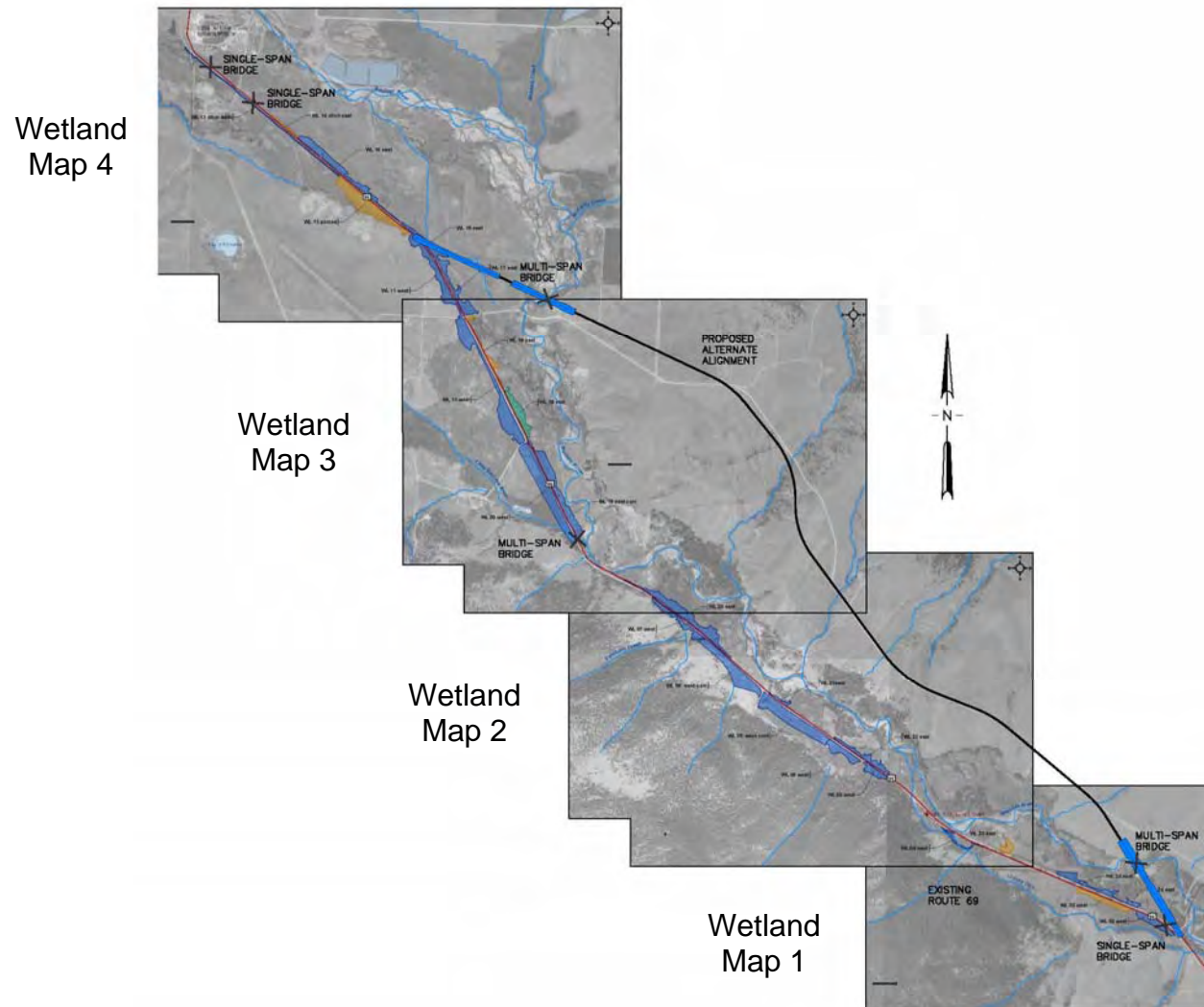


Figure 3-2
Wetland Map 1

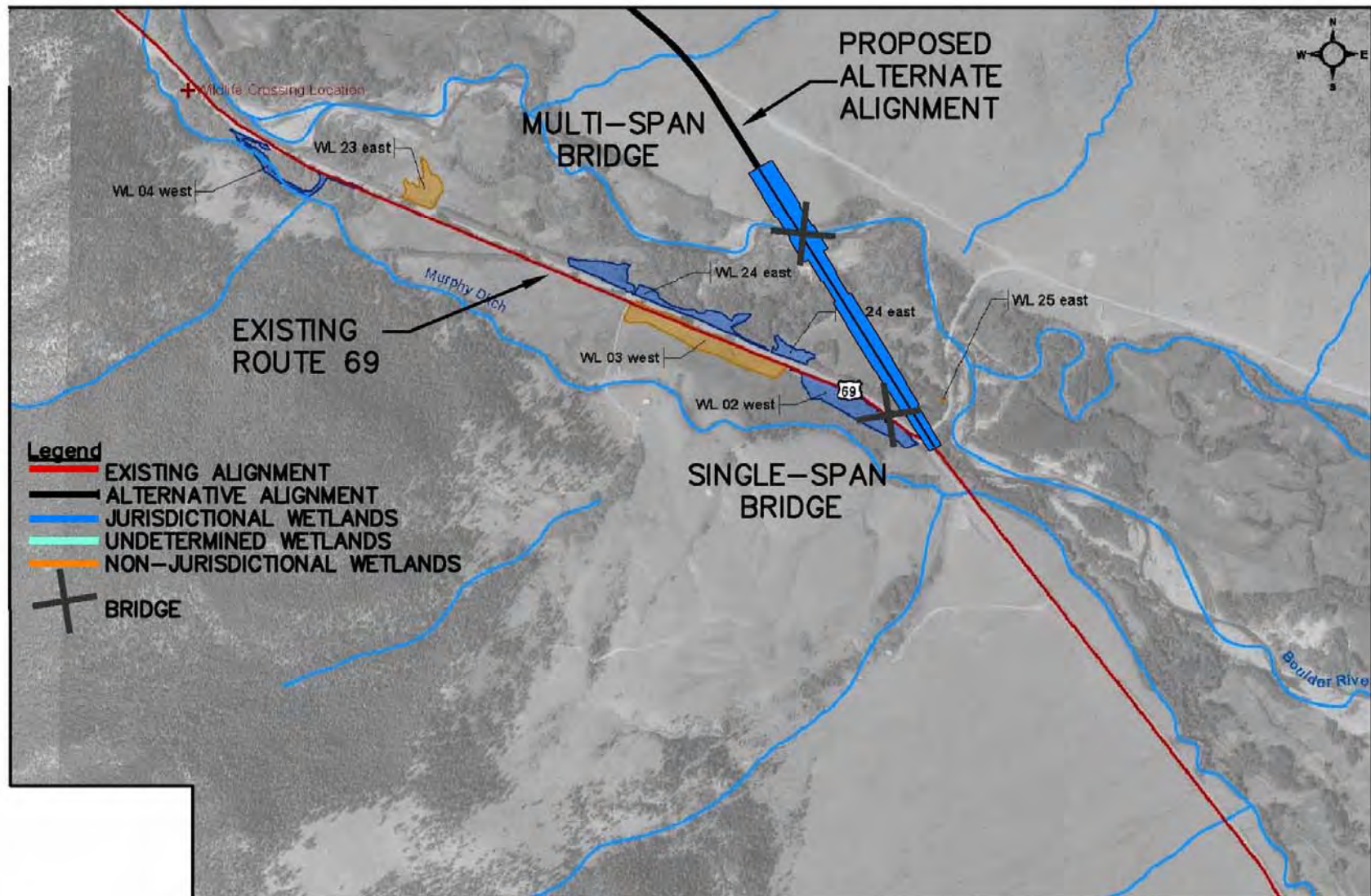


Figure 3-3
Wetland Map 2

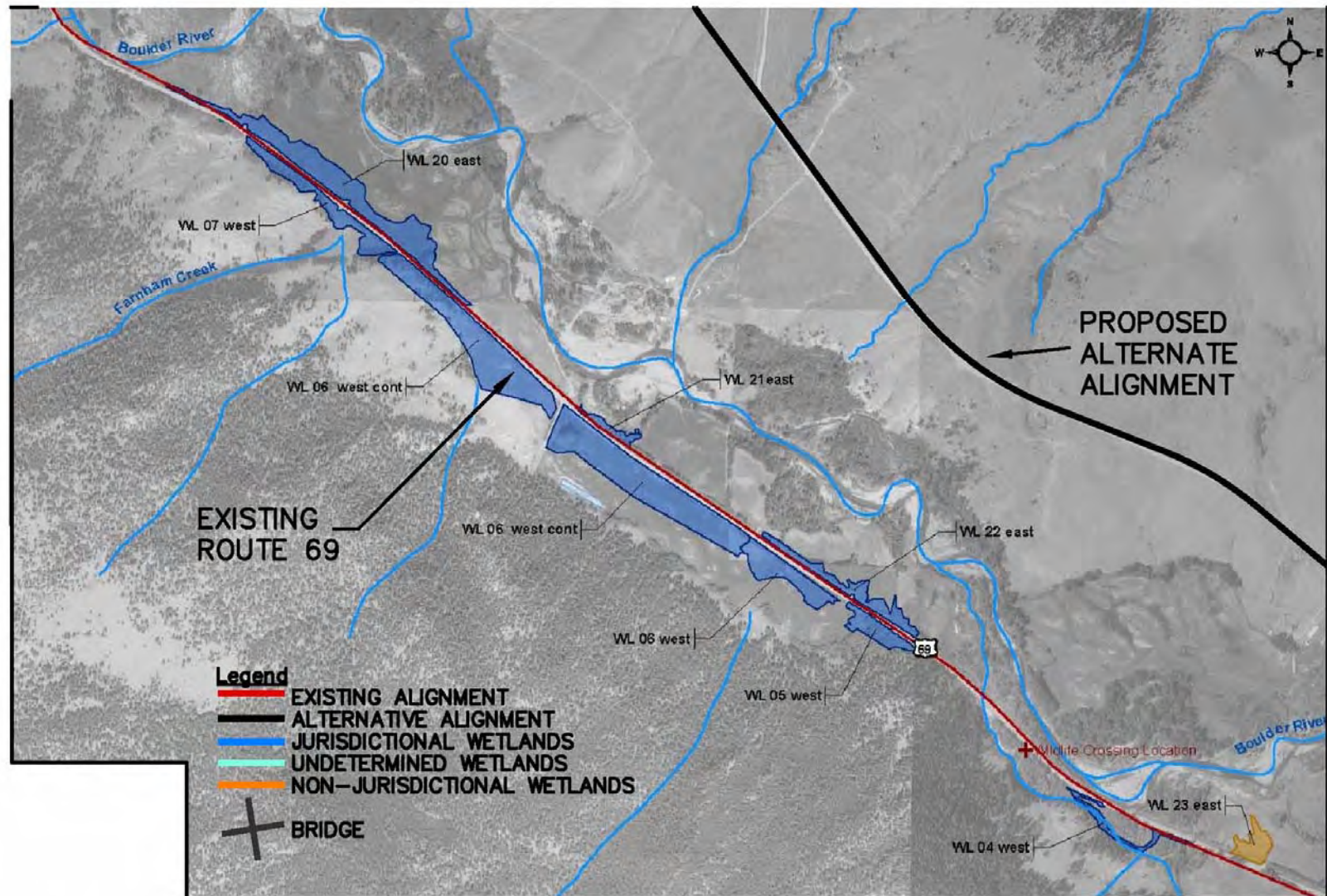


Figure 3-4
Wetland Map 3

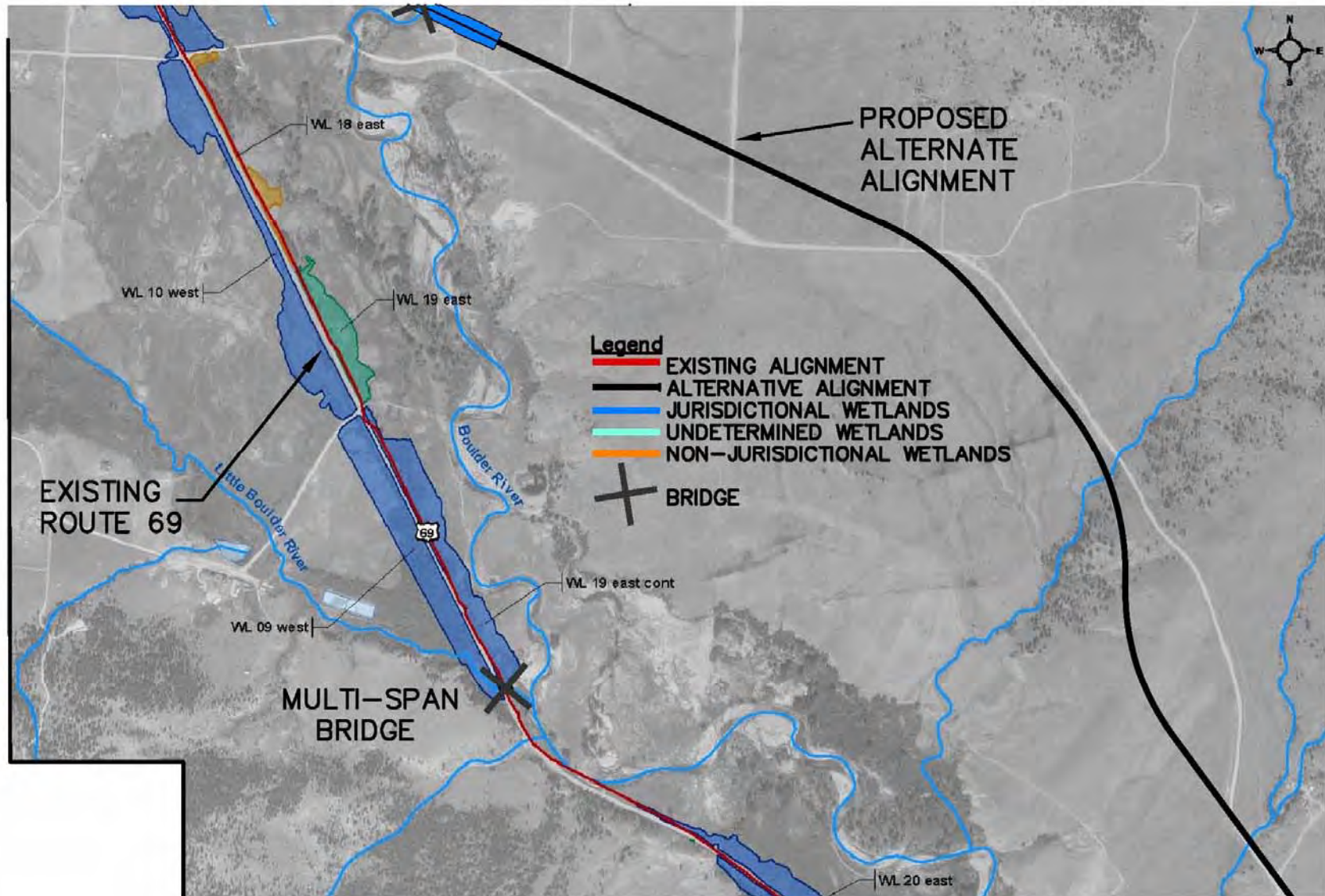
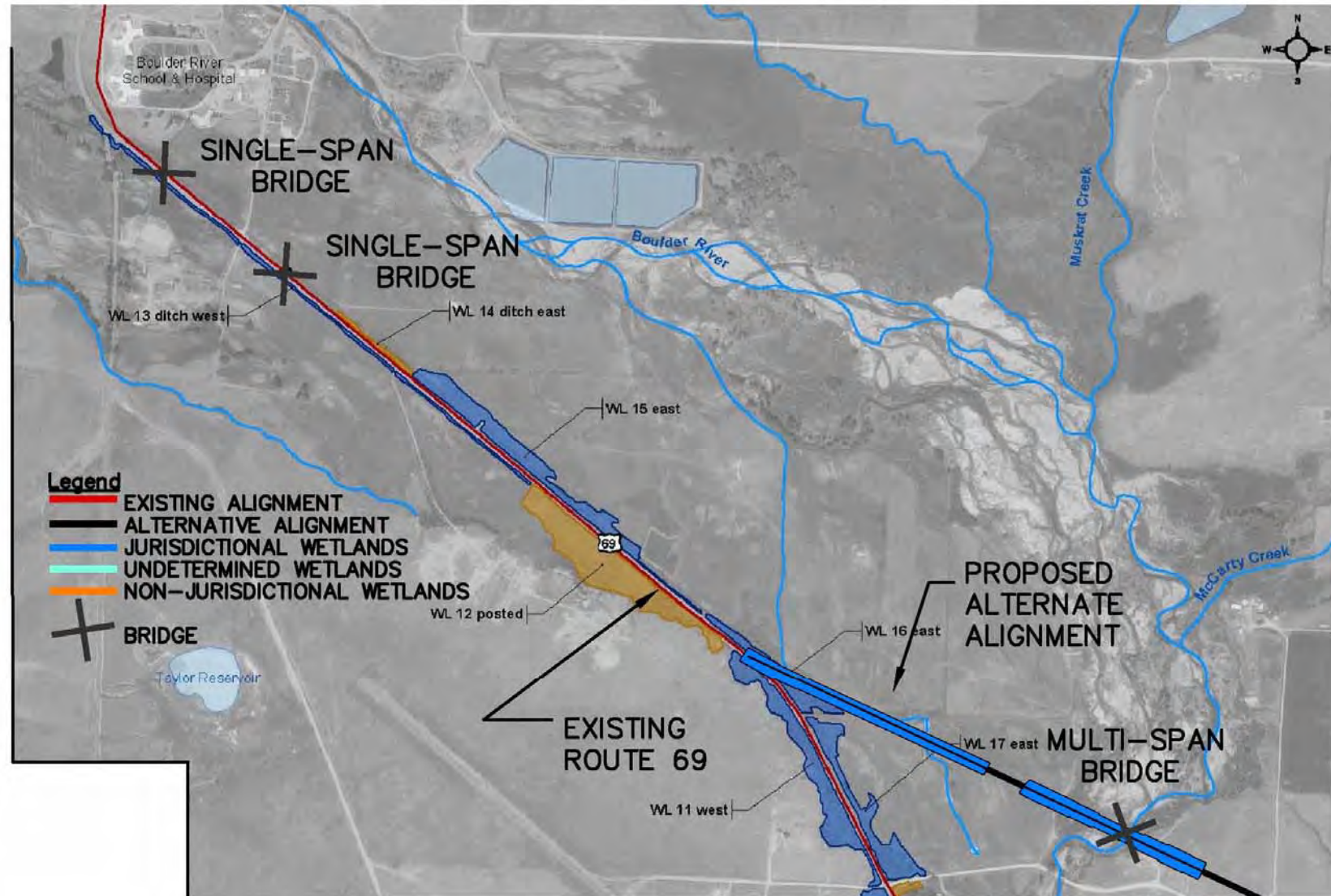


Figure 3-5
Wetland Map



Water Bodies

There are several water bodies located within the project area, including the Boulder River, Elkhorn Creek, Dry Creek, Jack Creek, and a number of unnamed ephemeral streams. Impacts to these water bodies would require further review under any NEPA/MEPA analysis.

Wildlife Resources and Habitat

Field surveys of the existing MT 69 alignment documented several wildlife crossing zones. The area shows signs of high and consistent use by deer, elk, moose, and coyotes. It is likely that smaller mammals use these crossing zones as well. The Boulder River corridor provides good browse, water, cover, and travel habitat to access prominent tributaries draining the uplands to the northeast, such as Browns Gulch. Wildlife use of the alternate alignment corridor is also expected to be high due to migration routes within Deerlodge National Forest.

Species of Concern

No wildlife species of concern were observed during field surveys. A great blue heron rookery with eighty-six birds was documented south of Clark Gulch on the east side of MT 69 in large cottonwoods on the floodplain. Additionally, a mountain plover occurrence was documented in 1994 near Cabin Gulch on the east side of MT 69.

No plant species of concern were observed during field surveys. The project area has potential habitat for Ute ladies' tresses, including meandering wetlands, gravel bars, old oxbows or floodplains at low elevations in open valley bottoms. Other habitat requirements are also present in the project area. An MNHP botanist confirmed that based on soil mapping, there may be Ute ladies' tresses located along the Boulder River, although there have been no observed occurrences.

Fisheries

The Boulder River supports several native fish species, as well as brook, brown, and rainbow trout. Several small trout were observed in shallow areas of the Boulder River and in ditches near their confluences with the Boulder River. No population estimates or quantitative surveys were conducted. Based on site visits, fish habitat in the Boulder River appears to be of good diversity and quality.

The proposed alternatives could be constructed without relocation of the Boulder River, Little Boulder River, or any of the unnamed perennial streams, although placement of bridge structures and culverts may impact fisheries. A study of these impacts would be required under any NEPA/MEPA analysis.

Noxious Weeds

Five species of noxious weeds were found within the project area. These species include spotted knapweed, Canada thistle, leafy spurge, Dalmatian toadflax, and tall buttercup. Any roadway

construction activities in this corridor would have the potential for the spread of noxious weeds and invasive plants.

Floodplains

There are delineated floodplains for the Boulder River throughout much of the corridor. Impacts to floodplains within the project corridor would require further study under any NEPA/MEPA analysis.

Threatened and Endangered Species

No federally-listed species were identified from the NRIS database search. A bald eagle nest was reported by an MDT biologist, although it was not observed in the field.

Hazardous Wastes

Based on an NRIS database search, there are no hazardous waste sites in the project corridor. There are a number of abandoned mine sites located upstream of the project area. Impacts to these sites resulting from the proposed alternatives would require further study under any NEPA/MEPA analysis.

Visual Resources

Views along the river would potentially be disrupted due to reconstruction and widening of the roadway and subsequent loss of trees and other vegetation along the current alignment. Impacts along the county road would also be expected, but with less severe loss of vegetation.

4.0 SCREENING CRITERIA

The purpose of this Alternatives Analysis was to compare the relative pros and cons of the existing MT 69 alignment and the alternate alignment and to determine if one or the other alternative could clearly be eliminated due to a magnitude of projected difference in impacts, costs, or constructability. The following screening criteria were developed for this project with this purpose in mind:

- **Social values** – What are the lifestyle impacts to the surrounding community and the traveling public from the two alternatives?
- **Economic values** – What is the functional value of the roadway facility to the users, and who bears the cost of the proposed improvements?
- **Environmental values** – What resources are most likely to be impacted, how severely, and how can they be mitigated?

5.0 ANALYSIS OF IMPACTS

This section of the feasibility study projects anticipated impacts from right-of-way acquisition, wetland conversion, and bridge construction. Cost criteria are discussed in Section 6.0.

Social Impacts

There are a number of social factors that can be assessed with regard to the proposed improvements. Neighboring residents have quality of life concerns regarding increased noise and traffic levels on the county road, as well as concerns regarding the loss of private land due to new right-of-way required by a new alignment. There is also a broader public concern about safety and accidents along our public highways. These issues are discussed briefly below:

Traffic

Estimated traffic in the year 2024 is projected to be just under 1,900 vehicles per day along MT 69 in this corridor. Truck traffic is estimated to be approximately 17 percent of that volume. While no estimates are available, it can be safely assumed that traffic volumes along the county road would be a small fraction of that projected along MT 69. Shifts in traffic patterns to a new route east of the river would be a noticeable change, but would amount to only about four or five cars per minute during the busiest hour of the day. Conversely, traffic along the existing MT 69 alignment would likely drop to a lower volume than is currently carried on the county road because there are very few residences and local access points on the existing MT 69 alignment as compared to the county road. If the primary travel way were moved east of the river, the existing MT 69 alignment could potentially be more attractive to local and regional recreational users due to its immediate proximity to the Boulder River and much lower traffic volumes.

Right-of-Way

A total of 100 acres of new right-of-way would be required for any new alignment on the east side of the river, most of which is currently in private ownership. This acquisition and the construction of a new roadway would likely result in a direct impact to some farming operations,

movement of cattle, future building plans, and the historic use of the existing county road. Comparably little right-of-way (approximately ten acres) would be required along the existing MT 69 alignment and would have little impact on adjacent uses.

Safety and Accidents

As documented earlier in this report, the accident rates (both in number and in severity) along the existing MT 69 route are substantially higher than on other similar routes across the state. These accidents have resulted in six fatalities in the period between 1994 and 2003. Given the location of accidents, it can be concluded that most accidents are the result of roadway geometry combined with speed, and oftentimes with adverse weather conditions. The portion of MT 69 between MP 31 and MP 35 experiences periodic icing due to the shading from the rock outcropping, and has resulted in higher than average accidents at that location. The proximity of the Boulder River and attendant wildlife also results in vehicle-animal conflicts. Moving the alignment east of the river would address the icing problem because the alternate alignment would not be as shaded as the existing MT 69 alignment. While the alternate alignment may result in fewer vehicle-animal conflicts because the corridor is more open and is not constrained by the Boulder River and rock outcroppings, wildlife movement is still likely in this corridor. Therefore, moving the alignment east of the river would adequately address the shading/icing problem, but may not provide an appreciable difference in vehicle-animal conflicts.

Economic Impacts

When considering the economic effects of roadway improvements, it is important to consider not only the financial cost in terms of taxpayer dollars, but also the cost of delaying improvements, or providing no improvements to the transportation facilities. Unimproved and failing infrastructure imposes a direct cost on those goods and service providers who use the highway system to access Montana communities. These perspectives are discussed briefly below.

Cost of construction

Detailed cost estimates for the two alternatives are provided in the next chapter. For brief comparison, reconstruction of the existing MT 69 alignment is projected to cost approximately \$16 million, while a new alignment would cost nearly \$25 million – approximately a 56 percent difference in projected cost. The alternate alignment would no longer utilize the Red Bridge, which was recently reconstructed at a cost of approximately \$783,000. The substantial difference between the two alternatives in directly related costs, as well as an accounting of the monies spent recently on the Red Bridge project, must play a role in responsible project decision-making.

Opportunity costs

When considering the impacts of infrastructure spending, it is important to recognize the real costs to the providers of goods and services if the most efficient transportation routes are congested, in disrepair, or are unsafe. They must choose either longer routes or accept the liability of traveling on these undesirable routes and pass on the costs to the consumer. Providing no improvements in this corridor would be inconsistent with the mission of the Department of Transportation and the Federal Highway Administration to provide safe and efficient roadways for people and commerce.

Environmental Impacts

As discussed in the Opportunities and Constraints section above, there are only a few areas of environmental concern that would be anticipated to experience any substantive impacts from either alternative. These impacts are discussed in detail below.

Wetland Resources

It is estimated that approximately 45 wetland acres would be impacted by the existing MT 69 alignment alternative. Wetland impacts were estimated by calculating the total right-of-way needed for the proposed reconstruction of the existing MT 69 alignment, excluding the existing roadway area, in locations where wetlands were delineated. The estimate includes impacts to both jurisdictional and non-jurisdictional wetlands.

Total wetland impact acreage along the alternate alignment is estimated to be approximately 30 acres. Between MP 31.1 and MP 35.7, wetland impacts were estimated by calculating the total right-of-way needed for the proposed reconstruction of the alternate alignment in locations where wetlands may exist based on soil mapping, aerial photographs, and windshield survey data. This method produced an acreage estimate which is likely slightly higher than a field survey would produce. Additionally, wetland impacts between MP 30.8 and MP 31.1 and between MP 35.7 to MP 37.1 as calculated for the existing MT 69 alignment were included in the alternate alignment estimate. A field survey would be required to determine a more precise quantity of wetland acreage that would be impacted under the alternate alignment between MP 31.1 to MP 35.7.

Impacted acreage along either the existing MT 69 or alternate alignment will likely generate the need for mitigation. In addition to direct wetland impacts, several ditches may need to be relocated, there may be impacts to wildlife values associated with the network of wetlands, there may be impacts to surface water recharge, and there may be impacts to possible habitat for Ute ladies' tresses associated with wetlands. (Further field work will be necessary to determine if Ute ladies' tresses occur in the proposed project area.) MDT has initiated discussions with Boulder Hot Springs, a landowner on the existing MT 69 alignment, in order to determine if opportunities for mitigation exist.

Construction of either alternative would require consultation and coordination with the U.S. Army Corps of Engineers (CoE).

Fisheries

Neither of the proposed build alternatives would involve relocation of the Boulder River, Little Boulder River, or any of the unnamed perennial streams.

There are 55 existing culverts located along the existing MT 69 alignment. All existing culverts would be replaced by longer culverts to accommodate road widening on the existing MT 69 alignment. Based on the location of intermittent streams, it was determined that a minimum of 27 culverts would be required along the alternate alignment. Impacts to fisheries resulting from placement of bridge structures and culverts would require further study under any NEPA/MEPA analysis.

Wildlife Habitat

Some initial concern has been raised about having two highways in this valley with the abundant wildlife and their usage of the Boulder River. While little data is available regarding wildlife migration routes in this area, it is safe to assume that wildlife access the river from the Elk Horn Mountains and the Helena National Forest to the east, and from the Deer Lodge National Forest to the west. As described in the traffic discussion above, regardless of which alternate is chosen, one route would remain predominantly a local-access roadway while the other would carry most of the regional traffic. Wildlife would not have any new barriers to cross, but might experience a change in migration routes.

6.0 COST ESTIMATES

Table 6.1 provides a summary of planning-level costs associated with each of the alternatives. The cost estimates are useful for the purpose of comparing the order of magnitude differences in price relative to each alternative. Tables detailing how these costs were calculated follow the narrative explanation of specific cost items. All costs are taken from the January to June 2006 Weighted Average Unit Bid Price Sheet unless otherwise noted.

Table 6.1 Planning-Level Cost Comparison

Item Description	Alternatives	
	Existing Alignment	Alternate Alignment
Clearing and Grubbing*	\$250,000	\$328,000
Remove Existing Pavement	\$129,000	\$33,000
Unclassified Excavation Including Haul	\$903,000	\$1,710,000
Unclassified Borrow	\$0	\$2,222,000
Rock Excavation*	\$66,000	\$0
Base*	\$776,000	\$790,000
Crushed Aggregate Course	\$1,453,000	\$1,469,000
Plant Mix Surfacing Grade S	\$1,110,000	\$1,116,000
Culverts 18" Diameter	\$49,000	\$30,000
24" Diameter*	\$94,000	\$0
36" Diameter	\$101,000	\$188,000
48" Diameter*	\$27,000	\$0
Remove Existing Bridge Structures	\$43,000	\$22,000
New Bridge Structures Single Span 1**	\$136,000	\$136,000
Single Span 2**	\$136,000	\$136,000
Single Span 3**	\$136,000	\$0
Multi Span 1**	\$478,000	\$1,257,000
Multi Span 2**	\$0	\$1,676,000
Painting and Striping	\$41,000	\$41,000
Signing**	\$39,000	\$39,000
Seeding**	\$28,000	\$30,000
Fencing	\$104,000	\$105,000
Wetland Mitigation**	\$1,350,000	\$900,000
Subtotal 1	\$7,449,000	\$12,228,000
Mobilization	\$745,000	\$1,223,000
Miscellaneous	\$1,863,000	\$3,057,000
Subtotal 2	\$10,057,000	\$16,508,000
Planning / Survey / Design	\$1,006,000	\$1,651,000
Traffic Control	\$1,509,000	\$661,000
Construction Contingencies	\$2,515,000	\$4,127,000
Construction Management	\$1,509,000	\$2,477,000
Acquire Right-of-Way**	\$35,000	\$350,000
Total Cost	\$16,631,000	\$25,774,000

* January to December 2005 Weighted Average Unit Bid Price Sheet

** Personal Communication

Narrative Description of Bid Items

The **Clearing and Grubbing** category was calculated as the area from the edge of required right-of-way to the opposite edge of required right-of-way. This category is larger for the alternate alignment than for the existing MT 69 alignment because there is no existing road through the majority of the portion between MP 31.1 and 35.7 for the alternate alignment, with the exception of the county road in a few areas. In contrast, the existing roadway area was subtracted from the total area, resulting in a smaller number for this category for the existing MT 69 alignment.

The **Unclassified Excavation Including Haul and Unclassified Borrow** categories were calculated by modeling the entire valley area based on USGS topographical maps. These categories are larger for the alternate alignment as compared to the existing MT 69 alignment because more earthwork would be involved along the alternate alignment. While the existing MT 69 alignment is mostly flat, the alternate alignment would involve work in more hilly terrain.

The **Base, Crushed Aggregate Course, and Plant Mix Surfacing** categories are slightly larger for the alternate alignment than for the existing MT 69 alignment because the alternate alignment is approximately 0.11 miles longer than the existing MT 69 alignment.

There are four **bridges** along the existing MT 69 alignment, including three single-span bridges and one multi-span bridge. These bridges would be removed and replaced. Two of the existing single-span bridges would also be removed and replaced under the alternate alignment. Additionally, two new bridges would be required along the alternate alignment, both of which would be multi-span bridges. The cost of each multi-span bridge on the alternate alignment is higher than the cost of the multi-span bridge on the existing MT 69 alignment because they are substantially longer.

The **Miscellaneous** category is estimated to be up to 25 percent for this project because of the potential for unknown factors. It includes items such as:

- | | | |
|--|-----------------------------|------------------------|
| • Slope treatment | • Temporary striping | • Seal coat |
| • Watering | • Temporary water | • Guardrail |
| • Ditch or channel excavation | • pollution/erosion control | • Cattle guards |
| • Shoring, cribbing, or extra excavation | • Sawcutting pavement | • Noxious weed control |
| • Asphalt for tack coat | • Fence replacement | • Mail boxes |
| • Incidental asphalt concrete pavement | • Riprap | |
| • Unsuitable excavation | • Public relations | |
| | • Topsoil | |
| | • Traffic gravel | |

Several cost categories are calculated as percentages of construction, including the mobilization and miscellaneous categories. Additionally, the **Planning/Survey/Design, Traffic Control, Construction Contingencies, and Construction Management** categories were calculated as percentages of the respective subtotals noted in Table 6.1. These categories were calculated using the same percentage factors for each alternative, with the exception of Traffic Control. A

smaller percentage was used to calculate Traffic Control for the alternate alignment due to the fact that it could be constructed while the majority of traffic remained on the existing MT 69 alignment. Reconstruction along MT 69 would require substantial traffic control and/or a detour route. The Planning/Survey/Design category does not include the cost of environmental clearance documentation. A construction contingency of 25 percent, the maximum amount recommended by MDT's cost estimation guidelines, was chosen because of the potential for higher cost of right-of-way acquisition in this area than estimated due to lack of landowner support for the project as well as rapid increases in land values in Montana, and what is considered to be a high potential for unknown factors due to the controversial nature of the project.

A larger amount of **right-of-way** would be required for the alternate alignment in comparison to the existing MT 69 alignment mainly because the alternate alignment would involve an almost entirely new alignment between MP 31.1 and 35.7. There are portions of this alignment that parallel the existing county road. Typically, right-of-way along county roads in Montana consists of a 60-foot easement, with 30 feet on each side of the center line. The county road was constructed on an easement, and no right-of-way is owned by either Jefferson County or the state along this route. The total right-of-way calculated for the alternate alignment assumes that there is no existing county right-of-way owned along the county road.

Table 6.2 Calculation of Costs for Existing MT 69 Alignment



 BOULDER SOUTH ALTERNATIVES ANALYSIS Planning Level Estimate of Costs				
Existing Alignment				
Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	100	AC	\$2,500	\$250,000
Remove Existing Pavement	96,000	SY	\$1.34	\$129,000
Unclassified Excavation Including Haul	217,000	CY	\$4.16	\$903,000
Unclassified Borrow	0	CY	\$10.05	\$0
Rock Excavation	6,000	CY	\$11.00	\$66,000
Base	38,800	CY	\$20.00	\$776,000
Crushed Aggregate Course	85,000	CY	\$17.09	\$1,453,000
Plant Mix Surfacing Grade S	37,700	Ton	\$29.45	\$1,110,000
Culverts				
18" Diameter	1,020	LF	\$47.24	\$49,000
24" Diameter	1,587	LF	\$59	\$94,000
36" Diameter	828	LF	\$121.92	\$101,000
48" Diameter	168	LF	\$159	\$27,000
Remove Existing Bridge Structures	4	LS	\$10,695	\$43,000
New Bridge Structures				
Single Span 1	1,421	SF	\$95	\$136,000
Single Span 2	1,421	SF	\$95	\$136,000
Single Span 3	1,421	SF	\$95	\$136,000
Multi Span 1	4,264	SF	\$112	\$478,000
Multi Span 2	0	SF	\$112	\$0
Painting and Striping	700	Gallons	\$58.45	\$41,000
Signing	1	Lump Sum	\$39,000	\$39,000
Seeding	70	AC	\$400	\$28,000
Fencing	66,528	LF	\$1.55	\$104,000
Wetland Mitigation	45	AC	\$30,000	\$1,350,000
SUBTOTAL 1				\$7,449,000
Mobilization @ 10%	1	Lump Sum	\$745,000	\$745,000
Miscellaneous @ 25%	1	Lump Sum	\$1,862,300	\$1,863,000
SUBTOTAL 2				\$10,057,000
Planning / Survey / Design @ 10%	1	Lump Sum	\$1,006,000	\$1,006,000
Traffic Control @ 15%	1	Lump Sum	\$1,508,600	\$1,509,000
Construction Contingencies @ 25%	1	Lump Sum	\$2,514,300	\$2,515,000
Construction Management @ 15%	1	Lump Sum	\$1,508,600	\$1,509,000
Acquire Right-of-Way	10	AC	\$3,500	\$35,000
TOTAL				\$16,631,000

Table 6.3 Calculation of Costs for Alternate Alignment

 BOULDER SOUTH ALTERNATIVES ANALYSIS Planning Level Estimate of Costs				
Alternate Alignment				
Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	131	AC	\$2,500	\$328,000
Remove Existing Pavement	24,556	SY	\$1.34	\$33,000
Unclassified Excavation Including Haul	411,000	CY	\$4.16	\$1,710,000
Unclassified Borrow	221,000	CY	\$10.05	\$2,222,000
Rock Excavation	0	CY	\$11.00	\$0
Base	39,500	CY	\$20.00	\$790,000
Crushed Aggregate Course	85,900	CY	\$17.09	\$1,469,000
Plant Mix Surfacing Grade S	37,900	Ton	\$29.45	\$1,116,000
Culverts				
18" Diameter	624	LF	\$47.24	\$30,000
24" Diameter	0	LF	\$59	\$0
36" Diameter	2,180	LF	\$86	\$188,000
48" Diameter	0	LF	\$159	\$0
Remove Existing Bridge Structures	2	LS	\$10,695	\$22,000
New Bridge Structures				
Single Span 1	1,421	SF	\$95	\$136,000
Single Span 2	1,421	SF	\$95	\$136,000
Single Span 3	0	SF	\$95	\$0
Multi Span 1	11,220	SF	\$112	\$1,257,000
Multi Span 2	14,960	SF	\$112	\$1,676,000
Painting and Striping	700	Gallons	\$58.45	\$41,000
Signing	1	Lump Sum	\$39,000	\$39,000
Seeding	75	AC	\$400	\$30,000
Fencing	67,690	LF	\$1.55	\$105,000
Wetland Mitigation	30	AC	\$30,000	\$900,000
SUBTOTAL 1				\$12,228,000
Mobilization @ 10%	1	Lump Sum	\$1,223,000	\$1,223,000
Miscellaneous @ 25%	1	Lump Sum	\$3,057,000	\$3,057,000
SUBTOTAL 2				\$16,508,000
Planning / Survey/ Design @ 10%	1	Lump Sum	\$1,651,000	\$1,651,000
Traffic Control @ 4%	1	Lump Sum	\$660,300	\$661,000
Construction Contingencies @ 25%	1	Lump Sum	\$4,127,000	\$4,127,000
Construction Management @ 15%	1	Lump Sum	\$2,476,200	\$2,477,000
Acquire Right-of-Way	100	AC	\$3,500	\$350,000
TOTAL				\$25,774,000

7.0 PUBLIC AND AGENCY CONCERNS

A Public Scoping Meeting was held on June 1, 2005. Approximately 100 members of the public were in attendance and over 50 written comments were submitted. The majority of these comments were strongly opposed to the proposed alternate alignment. Residents cited concerns relating to wildlife crossings; safety issues, especially regarding increased traffic volumes near rural residences; noise; increased traffic; and potential impacts to rural character and lifestyle. Residents also expressed concerns about habitat fragmentation and the fragmentation of farms and ranches located along the alternate alignment. In addition to the written comments, 27 people spoke at the public meeting in opposition to the proposed alternate alignment. Many area residents expressed a desire to reduce speeds and truck traffic on the existing MT 69 alignment.

A transcript of the public meeting, written comments received at the meeting, letters from the Jefferson County Commission and the Jefferson County Planning Board, and newspaper articles about the June 2005 public meeting are attached in Appendices A through D.

8.0 CONCLUSION

Based on this preliminary evaluation of the two conceptual alternatives, there is no clear preferred alternative. Reconstruction of the existing MT 69 alignment is over nine million dollars less expensive than construction of a new alignment across the river. This cost savings is provided through shorter bridge structures, less earthwork, and ten times less right-of-way. The alternate alignment would have approximately double the maintenance cost on an annual basis because if it was built, MDT would bear the responsibility of maintaining both the existing and alternate alignments. The most substantial drawback to the existing MT 69 alignment is the difference in wetland impacts. Construction of a new alignment on the other side of the river would reduce wetland impacts by at least 15 acres compared to reconstruction of the existing MT 69 alignment. This difference would need to be justified in the 404 permitting process. Table 8.1 provides a summary of costs and impacts related to the two alternatives.

Table 8.1
Summary Comparison Matrix

Criteria	Alternatives	
	Existing MT 69 Alignment	Alternate Alignment
Construction Cost	\$16,631,000	\$25,774,000
Yearly Road Maintenance Costs (including bridge maintenance)	\$13,857	\$27,956*
Route Mileage from MP 30.8 to MP 37.1	6.3 miles	6.41 miles
New Right-of-Way	10 acres	100 acres
Impacted Wetland Acreage	45 acres	30 acres

*\$13,857 yearly maintenance cost for existing alignment + \$14,099 annual cost for alternate alignment.

Coordination with the CoE will be necessary to determine feasibility of Section 404 permitting on either alignment. It would also be wise to continue discussions with the Boulder Hot Springs to determine whether wetland mitigation is feasible in the immediate project area, or if other wetland mitigation opportunities need to be identified in the Boulder Valley.